

First-trimester uterine Doppler: impact of conception method and corpus luteum absence

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Background

UtA PI between 11-and 14⁺¹-weeks' gestation are a well-established tool in the prediction of PE and SGA babies.

Little is known on the **impact of conception method** - spontaneous, ovulation induction/intra-uterine insemination (OI/IUI), fresh embryo transfer (ET), artificial cycle frozen ET (AC-FET) and natural cycle frozen ET (NC-FET)(figure 1) - on UtA PI profiles.

Objectives

Examine the **impact of different conception methods on first-trimester UtA PI measurements**. Explore the **relation between UtA PI, PE, and fetal birth weight outcomes across these different methods of conception**.

Study design

Single-center, retrospective cohort study conducted at UZ Brussel, with patient enrollment from May 2021 to December 2023. **3.730 unique patients** who underwent **uterine Doppler analysis between 11-and 14⁺¹-weeks' gestation** were included. UtA PI were corrected for gestational age, weight, racial origin, diabetes mellitus diagnosis and parity into **multiple of the median (MoM)**.

Results

Median UtA PI (MoM) was significantly lower in AC-FET (0.71, IQR 0.55-0.92) compared to other groups (spontaneous: 0.94 (IQR 0.74-1.15, OI/IUI: 0.89 (IQR 0.71-1.09) , fresh ET: 0.95 (0.78-1.19), NC-FET: 0.93 (IQR 0.70-1.11)), $p < 0.0001$ (figure 2).

The **highest PE incidence was found in AC-FET pregnancies (12.3%, 68/554)**, compared to spontaneous (2.9%, 73/2475), OI/IUI (4.3%, 5/116), fresh ET (8.9%, 16/179), and NC-FET (2.2%, 3/135), $p < 0.0001$.

The multivariate model, adjusting for parity, pre-existing hypertension, donor oocytes, and PCOS diagnosis, found that **AC-FET conception, PCOS pregnancies after fresh ET** ($p = 0.04$), and **use of donor oocytes in AC-FET pregnancies** ($p = 0.001$) were associated with an **increased PE risk**.

UtA PI in spontaneous and NC-FET pregnancies were related with subsequent PE outcomes ($p = 0.04$ and $p = 0.03$ respectively), while **AC-FET showed no relation between first trimester UtA PI and PE outcomes** ($p = 0.19$) (figure 3).

Neonatal birth weight in AC-FET uncomplicated pregnancies was significantly higher compared to spontaneous ($p < 0.001$), OI/IUI ($p = 0.04$), and fresh ET ($p < 0.001$) pregnancies. A **similar trend was observed in PE-complicated pregnancies**, though without significant interactions

Figure 1

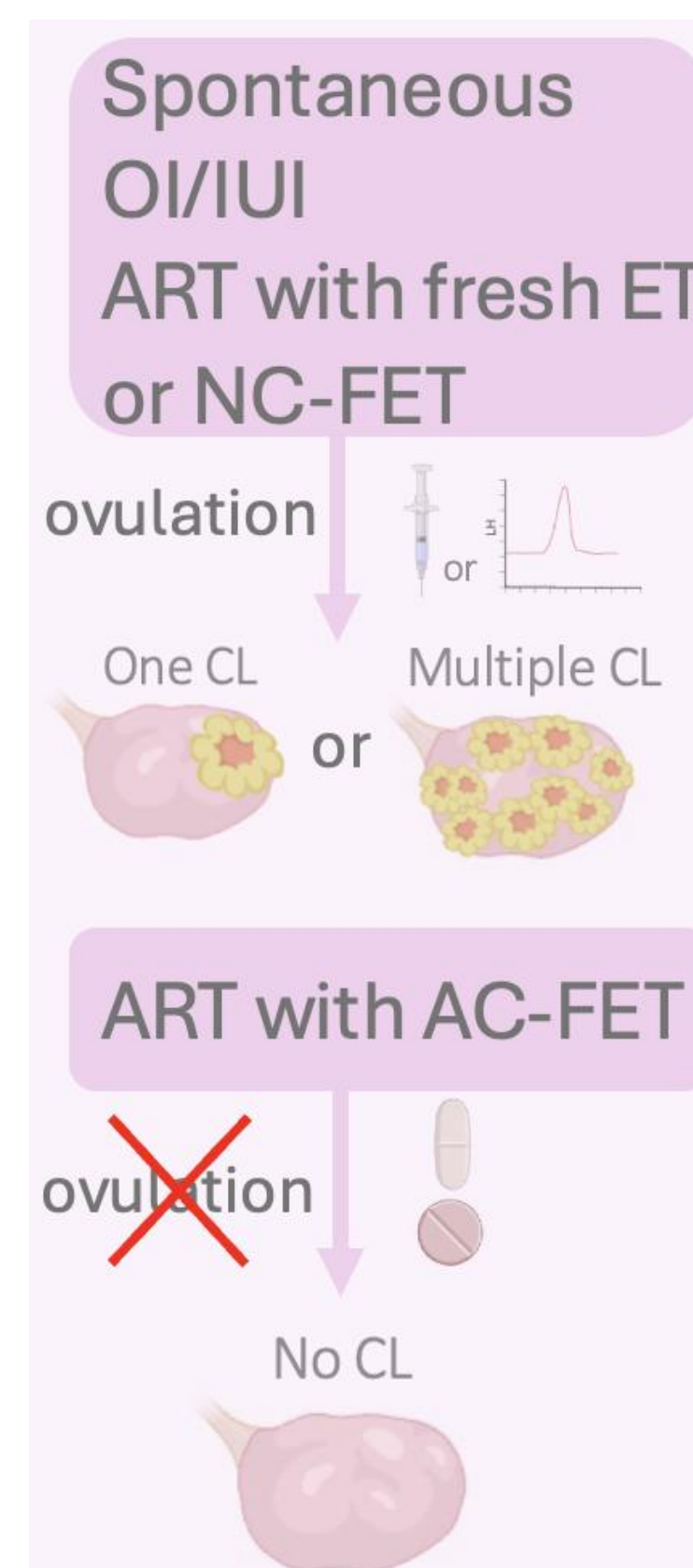


Figure 2

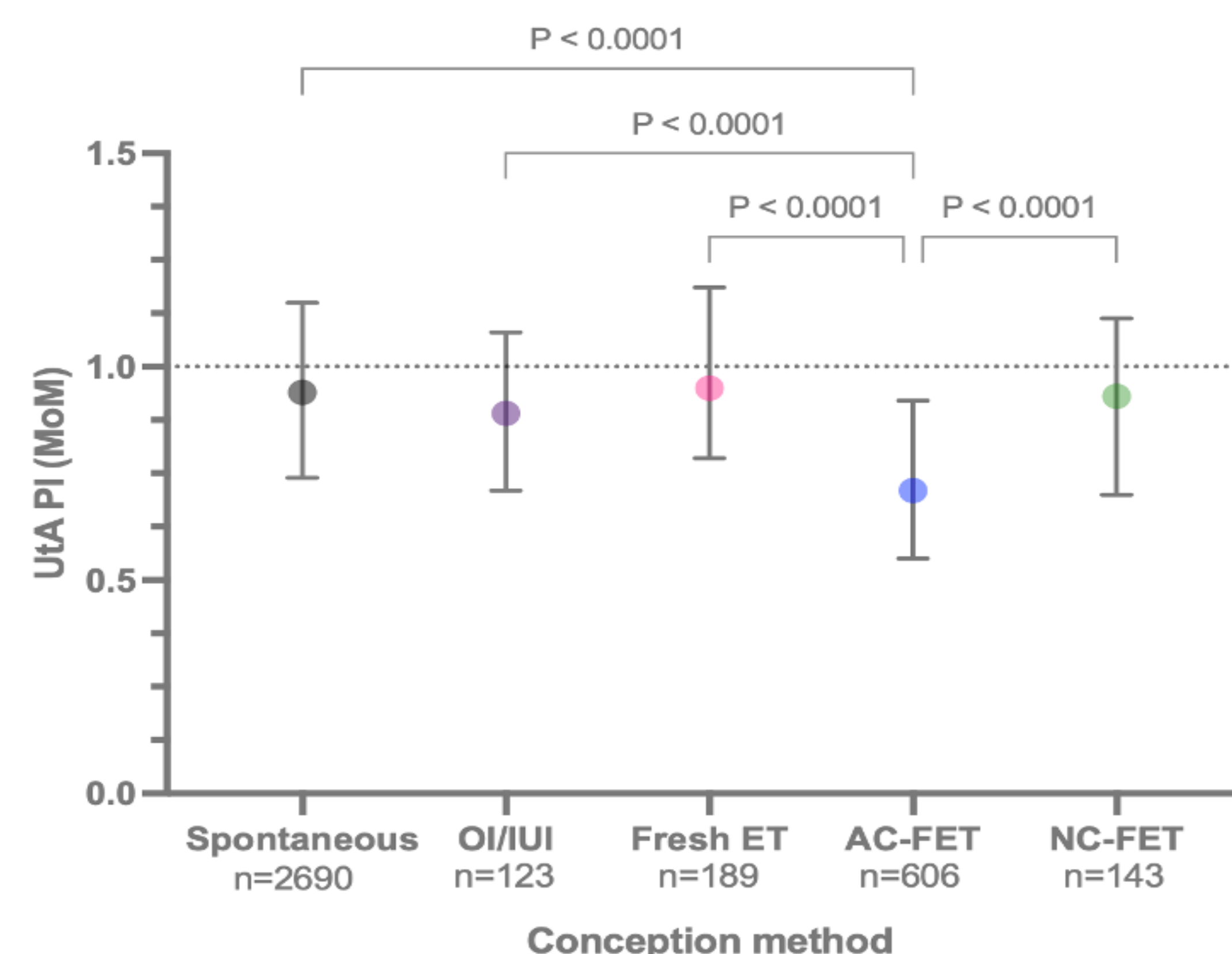
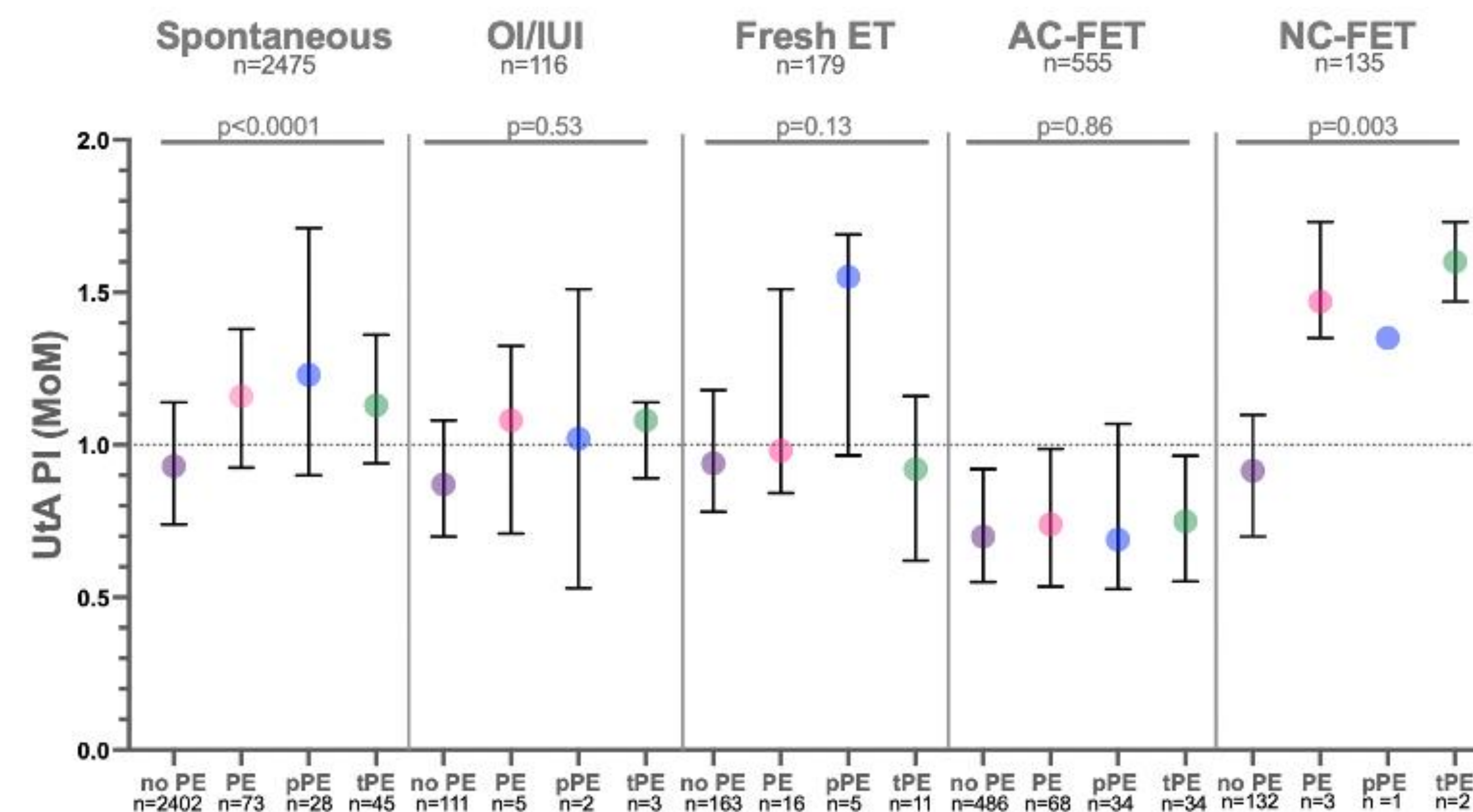


Figure 3



CL= corpus luteum, PE= preeclampsia, pPE = preterm PE tPE = term PE

PE screening tools should incorporate **different ART endometrial preparation techniques** and consider the **lack of relation between UtA PI and PE outcomes in AC-FET pregnancies**. If possible, **AC-FET cycles need to be avoided** due to their **association with an increased PE risk**.